

UNITED STATES PATENT APPLICATION

OF

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FOR

**HOLDER ASSEMBLY OF DRAIN HOSE AND
WASHING MACHINE USING THE SAME**

[0001] This application claims the benefit of Korean Application(s) No. 10-2002-0075360 filed November 29, 2002 which is/are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to a washing machine, and more particularly, to a holder assembly of a drain hose and washing machine thereof, by which it is facilitated to insert the drain hose in the holder assembly to fix thereto.

Discussion of the Related Art

[0003] Generally, in a washing machine, water and detergent are held in a lower part of a tub, a laundry is put in a drum provided in the tub, and the drum is rotated to perform washing, rinsing, and dewatering.

[0004] A washing machine according to a related art is explained by referring to FIG. 1 to FIG. 4 as follows.

[0005] FIG. 1 is a cross-sectional view of a washing machine according to a related art and FIG. 2 is a perspective view of a drain hose holder disassembled from a cabinet of a washing machine according to a related art.

[0006] FIG. 3 is a perspective view of a drain hose holder according to a related art, and FIG. 4 is a cross-sectional view of a drain hose holder installed at a cabinet in FIG. 3.

[0007] A washing machine 1 according to a related art consists of a cabinet 20 forming an exterior, a tub 3 provided in the cabinet 20 to hold a laundry and water supplied from outside, a drum 3a installed in the tub 3 to hold a laundry, and a motor 4 rotating the drum 3a.

[0008] As the water in the tub is discharged outside after completion of a washing or

rinsing step or on a dewatering step, a drain hose 5 guides the water outside the cabinet.

[0009] And, a drain hose holder 60 is installed at the cabinet to hold to lead the drain hose outside the washing machine.

[0010] In this case, the drain hose holder 60 is installed in a fixing hole 21 at a rear
5 side of the cabinet 20.

[0011] The drain hose holder 60 consists of a hose guide part 61 inserted in the fixing hole 21 to face inward the cabinet and a locking part 65 fixing the hose guide part to the fixing hole of the cabinet.

[0012] The hose guide part 61 consists of an entrance end 61a formed at a side in
10 which the drain hose is inserted, an exit end 61b opposite to the entrance end, and a hose loading part 61c between the entrance end and the exit end.

[0013] The hose guide part 61 has a curved outline such as an oval figure and a sphere so that the drain hose 4 is led outside the cabinet 20.

[0014] The locking part 65 consists of a bracket 65a inserted in the fixing hole of the
15 cabinet, an insertion protrusion 65b formed at an upper portion of the bracket, and a fixing protrusion 65c formed at a lower portion of the bracket. And, the bracket 65a consists of one end connected to the guide part, the other end vertically bent upward to support an outer wall of the cabinet, and an opening at its center.

[0015] The insertion protrusion 65b passes the fixing hole to be provided to an inner
20 wall of the cabinet above the fixing hole when the drain hose holder 60 is installed at the fixing hole 11.

[0016] And, the fixing protrusion 65c has a wedge shape having a predetermined slope so that the assembled drain hose holder 60 is not separated.

[0017] Meanwhile, the drain hose 5 has a bellows shape having wrinkles on its lateral

side to enable a free bending.

[0018] However, in the above-constructed drain hose holder, the hose guide part 61 is curved like an oval or spherical line. And, a cross-section of the entrance end 61a is similar to a hemi-circle so that a size of the cross-section is narrower than the loading part 61c or the exit end 61b. Hence, it is difficult to insert the drain hose 5 for assembly.

[0019] To overcome such a problem, many efforts are made to develop a holder assembly and a washing machine using the same which facilitate to assemble the drain hose connected to the tub.

SUMMARY OF THE INVENTION

[0020] Accordingly, the present invention is directed to a holder assembly of a drain hose and washing machine using the same that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

[0021] An object of the present invention, which has been devised to solve the foregoing problem, lies in providing a holder assembly of a drain hose and washing machine using the same, by which assembly of a drain hose extending outside a washing machine cabinet is facilitated.

[0022] It is another object of the present invention to provide a holder assembly of a drain hose and washing machine using the same, by which a drain hose is supported without being jammed.

[0023] Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent to those having ordinary skill in the art upon examination of the following or may be learned from a practice of the invention. The objectives and other advantages of the invention will be realized and attained by the subject

matter particularly pointed out in the specification and claims hereof as well as in the appended drawings.

[0024] To achieve these objects and other advantages in accordance with the present invention, as embodied and broadly described herein, there is provided, in a washing machine including a tub holding water, a cabinet having the tub provided inside, and a drain hose for discharging the water in the tub outside the cabinet, a holder assembly of a drain hose including a drain hose holder having an entrance end extending inside the cabinet to be bent inward to facilitate the drain hose to be inserted wherein the drain hose penetrates the drain hose holder to be guided downward and a fixing hole at a lateral side of the cabinet to fix the inserted drain hose holder fixed thereto.

[0025] The drain hose holder includes a guide part having the entrance end at one end and penetrating the fixing hole to be provided inside the cabinet and a locking part having an oval opening vertically provided at a central portion, the locking part provided at the other end of the guide part to be built in one body of the guide part, the locking part locking to fix the guide part to the fixing hole.

[0026] The guide part further includes a hose loading part having one side extending in winding along an edge of a lower semi-oval of the opening of the locking part in directions of an inside of the cabinet and a vertical axis of the opening and the other side built in one body of the entrance end extending to be bent toward the inside of the cabinet wherein a vertical cross-section of the hose loading part has a secondary-curved shape.

[0027] The entrance of the guide part includes both lateral sides extending in parallel from the locking part and a semi-circular bending side connecting ends of the lateral sides.

[0028] A horizontal cross-section of the entrance end of the guide part can be semi-oval.

[0029] The locking part includes an outer support body supporting an outer rim of the fixing hole, a central support body having the opening at a center and inserted in the fixing hole to support the fixing hole in a center direction, and an inner support body supporting the inside of the cabinet where the fixing hole is formed.

5 [0030] The inner support body includes an upper support body formed at an upper end of the central support body to be firstly inserted inside the cabinet via the opening in assembling the drain hose holder and at least one lower support body provided at the opening of the hose loading part to have a slant wedge shape of which inside direction of the cabinet is lowered.

10 [0031] More preferably, the lower support body is provided to each side of the hose loading part.

[0032] The outer support body further includes an exit fixing part extending in winding outside the cabinet along an edge of an upper semi-oval of the opening in the direction of the vertical axis of the opening.

15 [0033] The fixing hole is preferably formed at a lateral side of the cabinet.

[0034] It is to be understood that both the foregoing explanation and the following detailed description of the present invention are exemplary and illustrative and are intended to provide further explanation of the invention as claimed.

20 BRIEF DESCRIPTION OF THE DRAWINGS

[0035] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

[0036] FIG. 1 is a cross-sectional view of a washing machine according to a related art;

[0037] FIG. 2 is a perspective view of a drain hose holder disassembled from a cabinet of a washing machine according to a related art;

5 [0038] FIG. 3 is a perspective view of a drain hose holder according to a related art;

[0039] FIG. 4 is a cross-sectional view of a drain hose holder installed at a cabinet in FIG. 3;

[0040] FIG. 5 is a perspective view of a drain hose holder disassembled from a cabinet of a washing machine according to the present invention;

10 [0041] FIG. 6 is a perspective view of a drain hose holder according to the present invention; and

[0042] FIG. 7 is a cross-sectional view of a drain hose holder installed at a cabinet according to the present invention.

15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0043] Reference will now be made in detail to the preferred embodiment(s) of the present invention, examples of which are illustrated in the accompanying drawings. Throughout the drawings, like elements are indicated using the same or similar reference designations where possible.

20 [0044] A washing machine is an apparatus for washing such a laundry as clothes and the like, and is generally equipped with a drain hose for discharging water used in washing or rinsing the laundry in the tub or water separated from the laundry in dewatering.

[0045] Referring to FIG. 5 to FIG. 7, a holder assembly according to the present invention includes a drain hose holder 600 fixing a drain hose 500 for discharging water in a

tub (not shown in the drawing) outside a cabinet 200 and a fixing hole 210 formed at a rear side of the cabinet to fix the drain hose holder thereto.

[0046] The drain hose 500 penetrates a lateral side, and particularly, the rear side of the cabinet to extend outside the washing machine, and has a bellows shape of which lateral side is wrinkled to enable a free bending.

[0047] The fixing hole 210 is formed to have the drain hose holder inserted therein and has an oval shape.

[0048] The drain hose holder 600 is formed to be penetrated by the drain hose 500 and is specifically formed to guide the drain hose downward.

[0049] Specifically, the drain hose holder 600 includes a guide part 610 penetrating the fixing hole to be provided inside the cabinet and having an entrance end 611 formed at its one end to have the drain hose inserted therein and a locking part 650 having an oval opening, of which vertical axis is longer than its horizontal axis, at its center to fix the guide part 610 to the fixing hole 210.

[0050] The guide part 610 includes a hose loading part 612 having one end extending along a lower semi-oval edge of the opening of the locking part toward an inside of the cabinet and a direction of a vertical axis of the opening and the other end having an open upper side to be built in one body of the entrance end.

[0051] The hose loading part 612 guides the drain hose downward, and its vertical cross-section has a secondary-curve shape.

[0052] Namely, the hose loading part 612 has a figure provided by dividing a hollow sphere or a hollow oval figure into four equal parts vertically and horizontally centering on its center.

[0053] The entrance end 611 of the guide part extends to be bent from the other side

of the hose loading part to the inside of the cabinet so that the drain hose is easily inserted.

[0054] Specifically, a cross-sectional area of the entrance end 611 is formed not to be smaller than that of the hose loading part.

[0055] For this, the entrance end 611 of the guide part includes both lateral sides 611a
5 extending from the locking part 650 in parallel with each other and a semi-circular bending side 611b connecting two ends of the lateral sides 611a to each other.

[0056] And, the entrance end 611 of the guide part may have a semi-oval horizontal cross-section.

[0057] With such a structure, a length W2 of the entrance end 611 becomes longer
10 than a related art length W1, whereby a cross-sectional area of the entrance end 611 in which the drain hose 500 is inserted increases and a height H2 of the entrance end 611 is higher than a related art height H1. Hence, the drain hose can be easily inserted.

[0058] The locking part 650 is formed at the other end of the guide part to be built in one body of the guide part.

[0059] The locking part 650 includes an outer support body 651 supporting an outer
15 rim of the fixing hole, a central support body 652 inserted in the fixing hole to support the fixing hole in a center direction, and an inner support body 653 supporting an inside of the cabinet where the fixing hole is formed.

[0060] The inner support body 653 preferably includes an upper support body 653a
20 formed at an upper end of the central support body 652 to be firstly inserted inside the cabinet via the opening in assembling the drain hose holder 600 and at least one lower support body 653b provided at the opening of the hose loading part to have a slant wedge shape of which inside direction of the cabinet is lowered.

[0061] More preferably, the lower support body 653b is provided to each side of the

hose loading part.

[0062] The outer support body 651 may further include an exit fixing part 651a extending in winding outside the cabinet along an edge of an upper semi-oval of the opening in the direction of the vertical axis of the opening.

5 [0063] A process of assembling the above-constructed drain hose to the holder assembly according to the present invention is explained by referring to FIG. 7 as follows.

[0064] First of all, in order to install the drain hose holder 600 at the cabinet, the upper support body 653a of the inner support body of the locking part is inserted in the fixing hole 210 to be disposed on the cabinet inner wall above the fixing hole.

10 [0065] The guide part 610, the central support body 652, and the lower support body 653b of the locking part are inserted in an inside direction of the cabinet 200.

[0066] The drain hose holder 600 is inserted in the fixing hole 210 along a slant plane on the wedge type lower support body 653b to be fixed thereto and the locking part 650 is fixed to the fixing hole 210, whereby the drain hose holder 600 is installed at the cabinet 100.

15 [0067] Subsequently, one end of the drain hose 500 is inserted in the entrance end 611 of the guide part to discharge the drain hose 500 via the drain hose holder 600.

[0068] The inserted drain hose 500 follows the hose loading part 612 to be downwardly led to the exit fixing part 651a, and is then pulled out of the washing machine cabinet 200.

20 [0069] Thus, the water in the washing machine is drained outside via the above-assembled drain hose 500.

[0070] Accordingly, the present invention has the following advantages or effects.

[0071] First of all, the entrance end of the drain hose holder extends to be bent in the inside direction of the cabinet to be widened, thereby facilitating the insertion of the drain

hose.

[0072] Secondly, the drain hose is prevented from being bent or pressed so that its cross-sectional area is intact, whereby the water is smoothly drained.

[0073] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover such modifications and variations, provided they come within the scope of the appended claims and their equivalents.